



(12) **United States Patent**
Troy et al.

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(54) **AUTOMATED MOBILE BOOM SYSTEM FOR CRAWLING ROBOTS**

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(57) **ABSTRACT**

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(Continued)

A system comprising a multi-functional boom subsystem integrated with a holonomic-motion boom base platform. The boom base platform may comprise: Mecanum wheels with independently controlled motors; a pair of sub-platforms coupled by a roll-axis pivot to maintain four-wheel contact with the ground surface; and twist reduction mechanisms to minimize any yaw-axis twisting torque exerted on the roll-axis pivot. A computer with motion control software may be embedded on the boom base platform. The motion control function can be integrated with a real-time tracking system. The motion control computer may have multiple platform motion control modes: (1) a path following mode in which the boom base platform matches the motion path of the surface crawler (i.e., integration with crawler control); (2) a reactive mode in which the boom base platform moves based on the pan and tilt angles of the boom arm; and (3) a collision avoidance mode using sensors distributed around the perimeter of the boom base platform to detect obstacles.

(52) **U.S. Cl.**
CPC **F16M 11/18** (2013.01); **B66C 13/48** (2013.01); **B66C 23/72** (2013.01); **F16M 11/24** (2013.01); **F16M 11/42** (2013.01); **G01N 29/225** (2013.01);
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(58) **Field of Classification Search**
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See application file for complete search history.

12 Claims, 13 Drawing Sheets

